Decision Document

Solid Waste Management Unit A-04
Babbitt Landfill
Hawthorne Army Depot
Hawthorne, Nevada

September 2000

Hawthorne Army
Depot

Decision Document SWMU A-04

October 2001

The selected remedy is protective of human health and the environment. It has been shown that a complete pathway to human health and the environment does not exist, and there is no potential for an exposure pathway to be completed in the future.

U.S. Army

13 NOV 2001

Anne L. Davis
Lieutenant Colonel, U.S. Army
Commanding

State of Nevada

30 Nov 2001

Paul Liebendorfer
Chief, Bureau of Federal Facilities

Decision Document

Solid Waste Management Unit A-04
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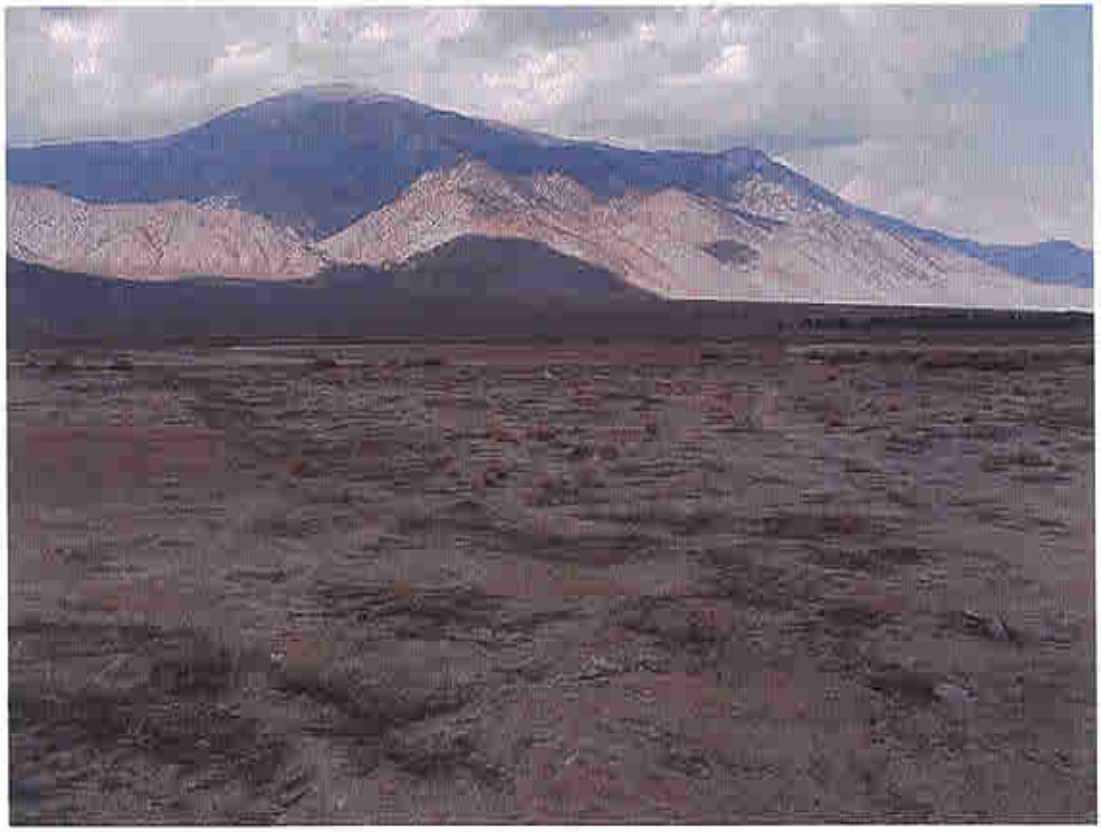
Hawthorne Army Depot
Hawthorne, Nevada



September 2000

Hawthorne Army
Depot

Decision Document
SWMU A-04, Babbitt Landfill
Hawthorne Army Depot
Hawthorne, Nevada

1.0 Introduction

This decision document describes the rationale for the proposed closure of SWMU A-04, Babbitt Landfill, at the Hawthorne Army Depot (HWAD), Hawthorne, Nevada. The U.S. Army Corps of Engineers, Sacramento, District, HWAD, and the Nevada Division of Environmental Protection (NDEP) prepared this document.

The U.S. Army Corps of Engineers, Sacramento District (USACE), tasked ecology and Environmental, Inc. (E&E), to perform a Resource conservation and Recovery Act (RCRA) Facility Investigation (RFI) of six Group A SWMU's at the Hawthorne Army Depot (HWAD), Hawthorne, Nevada. These tasks were conducted from 1993 through 1997. The NDEP is the lead regulatory agency for environmental issues at HWAD. The purpose of the monitoring was to determine the extent and degree of environmental impacts, if any, associated with activities performed at each SWMU. The primary goal of the investigation was to assess the environmental impacts and to report the findings, present conclusions, and recommend any remediation, if necessary.

With guidance from the NDEP, base wide proposed closure goals (PCGs) for soil were established as acceptable levels so that SWMU closure could be recommended and to assist in directing the investigative efforts toward those SWMUs where the target analytes were of greatest concern (Appendix A). These PCGs were used as action levels throughout this investigation and are used for comparison with the detected analytes in this report.

2.0 Site History

SWMU A-04 is a closed landfill located approximately 1,500 feet southwest of the former Babbitt Housing Area and approximately 1 mile east of the base of the Wassuk Mountains Range. The landfill was in operation from 1940 to 1975 and received domestic and office waste. The landfill was operated by the modified trench method and the operators used sand and gravel to cover the waste material. Refuse was routinely burned in the trenches; however, hazardous substance were never knowingly stored, released or disposed at the landfill. The landfill covers about 75 acres and is easily defined by the lack of desert shrub cover indigenous to the area. The survey date for the site is presented in Appendix B.

3.0 Site Conditions

The surface of Babbitt Landfill is characterized by short grasses and is void of mature desert shrubs. The surface is littered with debris (metal, bottles, cans, paper and other domestic waste). USAESHA has estimated the depth to ground water to be about 200 feet bgs. Chemicals of concern were semi-volatiles, pesticides, PCB's, barium, beryllium, chromium, silver, arsenic, lead, mercury, selenium, explosives, TPH and herbicides.

4.0 Investigations
E&E, Inc., conducted a Facility Assessment Report in 1994. The facility assessment in 1994 was conducted using station reading conductivity (Geonics EM-31) and a magnetometer. The anomalies detected from the equipment indicated the location of pits or trenches: these locations were mapped for further investigative work. In 1997, E&E, Inc., completed a Facility Investigation of Group A SWMU's, which included SWMU-A04, Babbitt Landfill. A total of 16 excavations were made in the SWMU area including five deep trenches measuring 20 feet long, 10 deep wide and 10 feet deep. Soil samples were collected from beneath the debris layer to detect if any leaching had occurred from the debris. Ten surface soil samples were also collected to help characterize the SWMU. In 1997, three monitoring wells were installed to determine if the site had impacted the groundwater. The locations of the investigation trenches are shown in Appendix B.

5.0 Investigation Results
The sampling in 1997 had only one detection of chemical of concern that exceeded remediation criteria from a total of 27 samples (Appendix C). There were two detections of lead at 100 mg/kg and 150 mg/kg, which did not exceed the residential criteria of 400 mg/kg. One detection of TPH – diesel at 220 mg/kg exceeded the criteria of 100 mg/kg. One detection of PCB – 1260 at 0.13 mg/kg, which did not exceed the criteria of 0.22 mg./kg. It was determined (based on field observations) that these sampling results indicated isolated conditions and do not reflect widespread contamination or bulk hazardous waste disposal. The subsequent sampling of the monitoring wells has not detected any contamination attributable to the landfill. One sampling event did detect Ammonium Picrate, which was later established as cross contamination effected by the sampling equipment.

6.0 Remediation
No remediation at this SWMU.

7.0 Remediation Results
Not applicable

8.0 Public Involvement
It is the U.S. Department of Defense and Army policy to involve the local community throughout the investigation process at an installation. To initiate this involvement, HWAD has established and maintains a repository library at the local public library. This repository includes final copies of all past studies and other documents regarding environmental issues at HWAD. As future environmental documents are made available to HWAD, the repository shall be updated.

HWAD has solicited community participation in establishment of a Restoration Advisory Board (RAB). To date there has been insufficient response and HWAD has not formed a RAB. HWAD has held open houses to inform the public of ongoing environmental issues. HWAD continues to solicit community involvement, and will establish a RAB should sufficient community interest be obtained.

9.0 Conclusions and Recommendations

The SWMU was closed by collecting the surface debris, placing it in an existing depression and covering it with one foot of clean soil. This was done for safety reasons. The monitoring wells installed in 1997 were abandoned according to the State of Nevada regulations and were closed under a separate report. The Army plans to relinquish their easement for the landfill with a quick claim deed to Mineral County with a restricted covenant running with the land that no residential buildings, nurseries, hospitals, or child-care facilities are built on the landfill site.

10.0 References

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Appendix A

PETER G. MORROS, *Director*

'LEN BIAGGI, *Administrator*

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Administration
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STATE OF NEVADA
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DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

333 W. Nye Lane, Room 138

Carson City, Nevada 89706

August 10, 2001

Mr. Vernon L. Shankle, P.E.
Chief, Operations Review Division
Department of The Army
Hawthorne Army Depot
1 South Maine Street
Hawthorne, NV 89415-9404

Subject: Adoption of EPA Region IX Preliminary Remediation Goals
Hawthorne Army Depot
Hawthorne, Nevada

The Nevada Division of Environmental Protection (NDEP) has received and evaluated Hawthorne Army Depot (HWAD) July 16, 2001 letter concerning the adoption of EPA Region IX Preliminary Remediation Goals (PRGs). Based on NDEP's review of the files, HWAD, NDEP and, the U.S. Army Center for Health, established cleanup standards in 1995/1996 using Subpart 5 calculations. As requested by NDEP during our meetings in April and July 2001, these cleanup standards were reviewed and updated based on current information.

Based on the Army's research, HWAD is requesting to adopt EPA Region IX Preliminary Remediation Goals (PRG's) for establishment of soil action levels. NDEP adopted these standards on October 3, 1996 under NAC 445A.2272 (d) "Contamination of soil: Establishment of action levels" and concurs with the adoption of both the residential and industrial standards for HWAD. NDEP recommends that residential standards be applied to all projects located in the main administrative portion of the base and former base housing areas primarily located on the west side of Highway 395 and that residential/industrial standards be used as appropriate for the industrial portion of the facility.

The Army needs to provide documentation and justification for establishment of cleanup standards for all chemicals of concern (e.g. ammonium picrate) at HWAD that are not identified

on the EPA Region IX PRG's tables (formerly IRIS) to NDEP. EPA Region IX currently maintains this table on the Internet at http://www.epa.gov/region09/waste/sfund/prg. Due to potential revisions to the PRG's tables, HWAD needs to evaluate EPA's Region IX PRGs table every two years and provide NDEP a revised written summary (January 2003, 2005, etc.).

If you have any questions, or need further clarification, please do not hesitate to contact our office (775) 687-4670, extension 3039 or email pliebend@govmail.state.nv.us.

Sincerely,

Paul Liebendorfer
Chief, Bureau of Federal Facilities

REN/KS/js

cc:
Herman Millsap, HWAD
Sophie Ngu, Sacramento Corps of Engineers
Jim Lukasko, Sacramento Corps of Engineers

Hawthorne Army Depot				
		NDEP established Soil Action Level, January 1996	Proposed EPA PRG table dated 11/01/00	
Contaminant	Casno	PCG	R PRG's	I PRG's
		mg/kg	mg/kg	mg/kg
1,1,1-Trichloroethane	71-55-6	7200	630	1400
1,1,2,2-Tetrachloroethane	79-34-5	35	0.38	0.9
1,2,3-Trichloropropane	96-18-4	480	0.0014	0.0031
1,2-Dibromoethane (EDB)	106-93-4	0.008	0.0069	0.048
1,2-Dichlorobenzene	95-50-1	7200	370	370
1,3,5-Trinitrobenzene	99-35-4	4	1800	26000
1,3-Dinitrobenzene	99-65-0	8	6.1	88
1,4-Dichlorobenzene	106-46-7	150	3.4	8.1
2,3,7,8-TCDD	1746-01-6	0.000005	0.0000039	0.000027
2,4,6-Trinitrotoluene	1180-96-7	233	16	82
2,4-Dinitrotoluene	121-14-2	2.6	120	1800
2,6-Dinitrotoluene	606-20-2	80	61	880
m-Nitrotoluene	88-72-2	800	370	1000
o-Nitrotoluene	99-08-1	800	370	1000
p-Nitrotoluene	99-99-0	800	370	1000
Acenaphthene	83-32-9	4800	N/A	N/A
Acetone	67-64-1	800	1600	6200
Aluminum	7429-90-5	80000	76000	100000
Anthracene	120-12-7	24000	N/A	N/A
Aroclor-1016	12674-11-2	25	3.9	29
Aroclor-1221	11104-28-2	25	0.22	1
Aroclor-1232	11141-16-5	25	0.22	1
Aroclor-1242	53469-21-9	25	0.22	1
Aroclor-1248	12672-29-6	25	0.22	1
Aroclor-1254	11097-96-1	25	0.22	1
Aroclor-1260	11096-82-5	25	0.22	1
Arsenic	7440-38-2	100	22	440
Barium	7440-39-3	2000	5400	100000
Benzene	71-43-2	10	0.65	1.5
Benzo(a)anthracene	56-55-3	0.96	N/A	N/A
Benzo(a)pyrene	50-32-8	0.1	N/A	N/A
Benzo(b)fluoranthene	205-99-2	0.96	N/A	N/A
Benzo(k)fluoranthene	207-08-9	10	N/A	N/A
Beryllium	7440-41-7	1	150	2200
bis(2-Chloroisopropyl)-ether	108-60-1	3200	2.9	8.1
bis(2-Ethylhexyl)-phthalate	117-81-7	1600	35	180
Bromoform	75-25-2	89	62	310
Bromomethane	74-83-9	112	3.9	13
Butyl benzyl phthalate	85-68-7	16000	12000	100000
C11-C22 (Diesel)	68834-30-5	100	N/A	N/A
Cadmium	7440-43-9	20	37	810
Carbon tetrachloride	56-23-5	10	0.24	0.53
Chlorobenzene	108-90-7	2000	150	540
Chloroform	67-66-3	120	0.24	0.52
Chloromethane	74-87-3	538	1.2	2.7
Chromium	7440-47-3	20	210	450
Chrysene	218-01-9	96	N/A	N/A
Dibenz(a,h)anthracene	53-70-3	0.96	N/A	N/A
Dibromochloromethane	124-48-1	83	1.1	2.7
Dibromomethane	74-95-3	800		
Dibutyl-phthalate	84-74-2	8000	6100	88000

Hawthorne Army Depot				
		NDEP established Soil Action Level, January 1996	Proposed EPA PRG table dated 11/01/00	
Contaminant	Casno.	PCG	R-PRG's	I-PRG's
		mg/kg	mg/kg	mg/kg
Dichlorodifluoromethane	75-71-8	16000	94	310
Diesel Fuel	11-84-7	100	N/A	N/A
Diethyl phthalate	84-66-2	64000	49000	100000
Ethylbenzene	100-41-4	8000	230	230
Fluoranthene	206-44-0	3200	N/A	N/A
Fluorene	86-73-7	3200	N/A	N/A
HMX	2691-41-0	4000	3100	44000
Lead	7439-92-1	100	400	750
m- & p-Xylene(s)	TT015	160000	N/A	N/A
Mercury	7439-97-6	24	23	610
Methylene Chloride	75-09-2	4800	8.9	21
Naphthalene	91-20-3	3200	N/A	N/A
Nitrate as N	14797-55-8	128000	N/A	N/A
Nitrobenzene	98-95-3	40	20	110
o-Xylene	95-47-6	160000	N/A	N/A
Phenol	108-95-2	48000	37000	100000
Picric Acid	88-89-1	7	N/A	N/A
Pyrene	129-00-0	2400	N/A	N/A
RDX	121-82-4	64	4.4	22
Selenium	7782-49-2	20	390	10000
Silver	7440-22-4	100	390	10000
Tetrachloroethene	127-18-4	15	5.7	19
Tetryl	479-45-8	800	N/A	N/A
Toluene	108-88-3	16000	520	520
Total xylenes	1330-20-7	160000	N/A	N/A
Xylenes	79-01-6	10	210	210
Trichlorofluoromethane	75-69-4	24000	390	2000
Vinyl chloride	75-01-4	24000	0.15	0.83

Appendix C

Table 3-17

SWMU A-04
BABBITT LANDFILL
RFI ANALYTICAL RESULTS
HAWTHORNE army DEPOT
HAWTHORNE, NEVADA

Sample Number	2-A04-SBS1-12-007	2-A04-SS1-03-000	2-A04-SBS1-05-005	2-A04-SBS1-02-005	2-A04-SS1-10-000	Soil Remediation Criteria
Trench Locations	TP-1	TP-2	TP-2	TP-3	TP-4	
Depth (feet)	6 to 7	0 to 0.5	4 to 5	4 to 5	0 to 0.5	
Metals (mg/kg)						
Arsenic (Method 6010)	3.0	2.0	2.8	2.4	2.8	100
Barium (Method 6010)	67	60	68	53	39	2,000
Cadmium (Method 6010)	ND (0.51.U)	ND (0.50 U)	ND (0.51 U)	ND (0.52 U)	ND (0.50 U)	20
Chromium (total) (Method 6010)	1.2	3.5	3.4	2.9	ND (1.0 U)	100
Lead (Method 7421)	8.5	4.6	5.3	3.8	10	100
Mercury (solid) (Method 7471)	ND (0.020 U)	ND (0.020 U)	ND (0.020 U)	0.11	ND (0.020 U)	4.0
Selenium (Method 7740)	ND (0.51 U)	ND (0.50 U)	ND (0.51 U)	ND (0.52 U)	ND (0.50 U)	20
Total Petroleum Hydrocarbons (Method 8015m) (mg/kg)						
TPH as diesel	37	ND (5.0 U)	ND (5.1 U)	ND (5.2 U)	220	100
TPH as gasoline	None detected.					
Semi-Volatile Organics (Method 8270) (mg/kg)						
Benzo(a)Pyrene	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	ND (0.34 U)	ND (0.33 U)	0.096
Benzo(b)Fluoranthene	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	ND (0.34 U)	ND (0.33 U)	0.96
Benzo(k)Fluoranthene	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	ND (0.34 U)	ND (0.33 U)	9.59
Bis(2-ethylhexyl)phthalate	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	0.036 J	ND (0.33 U)	50
Chrysene	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	ND (0.34 U)	ND (0.33 U)	95.9
Di-N-Butyl-Phthalate	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	ND (0.34 U)	ND (0.33 U)	8,000
Fluoranthene	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	ND (0.34 U)	ND (0.33 U)	3,200
Pyrene	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	ND (0.34 U)	ND (0.33 U)	2,400
TCL Pesticides/PCBs (Method 8080) (mg/kg)						
4,4-DDD	0.0013 J	ND (0.0020 U)	ND (0.0020 U)	ND (0.0021 U)	0.010 J	2.91
4,4-DDE	0.026	ND (0.0020 U)	ND (0.0020 U)	ND (0.0021 U)	ND (0.020 U)	2.06
4,4-DDT	0.013	ND (0.0050 U)	ND (0.0051 U)	ND (0.0052)	0.076	2.06
PCB 1260	ND (0.020 U)	ND (0.020 U)	ND (0.020 U)	ND (0.021 U)	ND (0.20 U)	0.09
Volatile Organics (Method 8240) (mg/kg)						
Methylene chloride	ND (0.0051 U)	NA	ND (0.0051 U)	ND (0.0052 U)	NA	93.3
Nitroaromatics (Method 8330) (mg/kg)						
2,4,6-TNT	ND (1.0 U)	ND (0.010 U)	ND (1.0 U)	ND (1.0 U)	ND (0.001 U)	233.3
Herbicides (Method 8150) (mg/kg)	None detected.					

Key at end of table.

Table 3-17

SWMU A-04
BABBITT LANDFILL
RFI ANALYTICAL RESULTS
HAWTHORNE ARMY DEPOT
HAWTHORNE, NEVADA

Sample Number	2-A04-SBS1-17-005	2-A04-SS1-08-000	2-A04-SBS1-15-005	2-A04-SS1-07-000	2-A04-SBS1-13-008	Soil Remediation Criteria
Trench Locations	TP-4	STR-1	STR-1	STR-2	STR-2	
Depth (feet)	4 to 5	0 to 0.5	4 to 5	0 to 0.5	7 to 8	
Metals (mg/kg)						
Arsenic (Method 6010)	4.8	3.6	3.0	4.2	2.2	100
Barium (Method 6010)	51	73	62	79	72	2,000
Cadmium (Method 6010)	ND (0.52 U)	ND (0.50 U)	ND (0.52 U)	ND (0.50 U)	ND (0.51 U)	20
Chromium (total) (Method 6010)	1.4	1.5	ND (1.0 U)	1.7	2.3	100
Lead (Method 7421)	6.4	5.8	4.7	6.3	41	100
Mercury (solid) (Method 7471)	ND (0.020 U)	ND (0.020 U)	ND(0.021 U)	ND (0.020 U)	ND (0.020 U)	4.0
Selenium (Method 7740)	ND (0.52 U)	ND (0.50 U)	ND (0.52 U)	ND (0.50 U)	ND (0.51 U)	20
Total Petroleum Hydrocarbons (Method 8015m) (mg/kg)						
TPH as diesel	32	ND (5.0 U)	ND (5.2 U)	ND (5.0 U)	6.3	100
TPH as gasoline	None detected.					
Semi-Volatile Organics (Method 8270) (mg/kg)						
Benzo(a)Pyrene	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	0.096
Benzo(b)Fluoranthene	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	0.96
Benzo(k)Fluoranthene	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	9.59
Bis(2-ethylhexyl)phthalate	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	ND (0.33 U)	0.092 J	50
Chrysene	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	95.9
Di-N-Butyl-Phthalate	0.560	ND (0.33 U)	ND (0.34 U)	ND (0.54 U)	ND (0.34 U)	8,000
Fluoranthene	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	3,200
Pyrene	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	2,400
TCL Pesticides/PCBs (Method 8080) (mg/kg)						
4,4-DDD	ND (0.0021 U)	ND (0.0020 U)	ND (0.0021 U)	ND (0.0020 U)	ND (0.0020 U)	2.91
4,4-DDE	ND (0.0021 U)	ND (0.0020 U)	ND (0.0021 U)	0.0018 J	(0.0010 J	2.06
4,4-DDT	0.0070	ND (0.0050 U)	ND (0.0052 U)	ND (0.0050 U)	ND (0.0051 U)	2.06
PCB 1260	ND (0.021 U)	ND (0.020 U)	ND (0.021 U)	ND (0.020 U)	ND (0.020 U)	0.09
Volatile Organics (Method 8240) (mg/kg)						
Methylene chloride	ND (0.0052 U)	NA	ND(0.0051 U)	NA	ND (0.0051 U)	93.3
Nitroaromatics (Method 8330) (mg/kg)						
2,4,6-TNT	ND (1.0 U)	ND (0.001 U)	ND (1.0 U)	ND (0.010 U)	ND (1.0 U)	233.3
Herbicides (Method 8150) (mg/kg)	None detected.					

Key at end of table.

Table 3-17

SWMU A-04
BABBITT LANDFILL
RFI ANALYTICAL RESULTS
HAWTHORNE ARMY DEPOT
HAWTHORNE, NEVADA

Sample Number	2-A04-SBS1-14-005	2-A04-SS1-06-000	2-A04-SBS1-11-007	2-A04-SBS1-10-008	2-A04-SS1-09-008	Soil Remediation Criteria
Trench Locations	STR-3	STR-4	STR-4	STR-6	STR-7	
Depth (feet)	4 to 5	0 to 0.5	6 to 7	7 to 8	0 to 0.5	
Metals (mg/kg)						
Arsenic (Method 6010)	4.1	2.0	3.6	2.2	3.0	100
Barium (Method 6010)	54	40	78	63	69	2,000
Cadmium (Method 6010)	ND (0.52 U)	ND (0.50 U)	ND (0.52 U)	ND (0.52 U)	ND (0.50 U)	20
Chromium (total) (Method 6010)	3.2	1.7	1.9	12	4.8	100
Lead (Method 7421)	3.8	5.6	17	11	30	100
Mercury (solid) (Method 7471)	ND (0.021 U)	ND (0.020 U)	ND (0.021 U)	ND (0.021 U)	ND (0.020 U)	4.0
Selenium (Method 7740)	ND (0.52 U)	ND (0.50 U)	ND (5.2 U)	ND (0.52 U)	ND (0.50 U)	20
Total Petroleum Hydrocarbons (Method 8015m) (mg/kg)						
TPH as diesel	ND (5.2 U)	ND (5.0 U)	ND (5.2 U)	ND (5.2 U)	ND (5.0 U)	100
TPH as gasoline	None detected.					
Semi-Volatile Organics (Method 8270) (mg/kg)						
Benzo(a)Pyrene	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	ND (0.34 U)	ND (0.33 U)	0.096
Benzo(b)Fluoranthene	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	ND (0.34 U)	ND (0.33 U)	0.96
Benzo(k)Fluoranthene	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	ND (0.34 U)	ND (0.33 U)	9.56
Bis(2-ethylhexyl)phthalate	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	ND (0.34 U)	ND (0.33 U)	50
Chrysene	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	ND (0.34 U)	ND (0.33 U)	95.9
Di-N-Butyl-Phthalate	ND (0.34 U)	ND (0.54 U)	ND (0.34 U)	ND (0.34 U)	ND (0.33 U)	8,000
Fluoranthene	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	ND (0.34 U)	ND (0.33 U)	3,200
Pyrene	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	ND (0.34 U)	ND (0.33 U)	2,400
TCL Pesticides/PCBs (Method 8080) (mg/kg)						
4,4-DDD	ND (0.0021 U)	ND (0.0020 U)	ND (0.0021 U)	ND (0.0021 U)	ND (0.0020 U)	2.91
4,4-DDE	ND (0.0021 U)	0.011	0.0013 J	ND (0.0021 U)	0.0015 J	2.06
4,4-DDT	ND (0.0052 U)	ND (0.0050 U)	ND (0.0052 U)	ND (0.0052)	ND (0.0050 U)	2.06
PCB 1260	ND (0.021 U)	ND (0.020 U)	ND (0.021 U)	ND (0.021 U)	* 0.13	0.09
Volatile Organics (Method 8240) (mg/kg)						
Methylene chloride	ND (0.0052 U)	NA	ND (0.0052 U)	ND (0.0052 U)	NA	93.3
Nitroaromatics (Method 8330) (mg/kg)						
2,4,6-TNT	ND (1.0 U)	ND (0.010 U)	ND (1.0 U)	ND (1.0 U)	ND (0.001 U)	233.3
Herbicides (Method 8150) (mg/kg)	None detected.					

* Superseded by Soil Remediation Criteria in Appendix A of this document.

Key at end of table.

Table 3-17

SWMU A-04
BABBITT LANDFILL
RFI ANALYTICAL RESULTS
HAWTHORNE ARMY DEPOT
HAWTHORNE, NEVADA

Sample Number	2-A04-SBS1-16-005	2-A04-SBS2-16-005	2-A04-SS1-01-000	2-A04-SBS1-01-005	2-A04-SBS1-09-010	Soil Remediation Criteria
Trench Locations	STR-7	STR-7	STR-8	STR-8	DTR-1	
Depth (feet)	4 to 5	4 to 5	0 to 0.5	4 to 5	9 to 10	
Metals (mg/kg)						
Arsenic (Method 6010)	3.3	3.4	2.2	1.9	2.8	100
Barium (Method 6010)	78	78	74	54	69	2,000
Cadmium (Method 6010)	ND (0.52 U)	ND (0.52 U)	ND (0.50 U)	ND (0.52 U)	ND (0.51 U)	20
Chromium (total) (Method 6010)	ND (1.0 U)	1.5	3.0	2.9	2.5	100
Lead (Method 7421)	3.2	3.4	16	3.6	5.7	100
Mercury (solid) (Method 7471)	ND (0.020 U)	ND (0.020 U)	ND (0.020 U)	ND (0.021 U)	ND (0.020 U)	4.0
Selenium (Method 7740)	ND (0.52 U)	ND (0.52 U)	ND (0.50 U)	ND (0.52 U)	ND (0.51 U)	20
Total Petroleum Hydrocarbons (Method 8015m) (mg/kg)						
TPH as diesel	ND (5.2 U)	ND (5.2 U)	ND (5.0 UR)	ND (5.2 UJ)	ND (5.1 U)	100
TPH as gasoline	None detected.					
Semi-Volatile Organics (Method 8270) (mg/kg)						
Benzo(a)Pyrene	ND (0.34 U)	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	ND (0.34 U)	0.096
Benzo(b)Fluoranthene	ND (0.34 U)	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	ND (0.34 U)	0.96
Benzo(k)Fluoranthene	ND (0.34 U)	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	ND (0.34 U)	9.56
Bis(2-ethylhexyl)phthalate	ND (0.34 U)	ND (0.34 U)	0.040 J	0.044 J	0.100 J	50
Chrysene	ND (0.34 U)	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	ND (0.34 U)	95.9
Di-N-Butyl-Phthalate	ND (0.34 U)	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	ND (0.34 U)	8,000
Fluoranthene	ND (0.34 U)	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	ND (0.34 U)	3,200
Pyrene	ND (0.34 U)	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	ND (0.34 U)	2,400
TCL Pesticides/PCBs (Method 8080) (mg/kg)						
4,4-DDD	ND (0.0021 U)	ND (0.0021 U)	ND (0.0020 U)	ND (0.0021 U)	ND (0.0020 UJ)	2.91
4,4-DDE	ND (0.0021 U)	ND (0.0021 U)	0.0014 J	ND (0.0021 U)	0.0008 J	2.06
4,4-DDT	ND (0.0052 U)	ND (0.0052 U)	ND (0050 U)	ND (0.0052)	0.0006 J	2.06
PCB 1260	ND (0.021 U)	ND (0.021 U)	ND (0.020 U)	ND (0.021 U)	ND (0.020 UJ)	0.09
Volatile Organics (Method 8240) (mg/kg)						
Methylene chloride	ND (0.0052 U)	ND (0.0052 U)	NA	ND (0.0052 U)	ND (0.0051 U)	93.3
Nitroaromatics (Method 8330) (mg/kg)						
2,4,6-TNT	ND (1.0 U)	ND (1.0 U)	ND (1.0 U)	ND (1.0 U)	ND (1.0 U)	233.3
Herbicides (Method 8150) (mg/kg)	None detected.					

Key at end of table.

Table 3-17

SWMU A-04
BABBITT LANDFILL
RFI ANALYTICAL RESULTS
HAWTHORNE ARMY DEPOT
HAWTHORNE, NEVADA

Sample Number	2-A04-SS1-05-000	2-A04-SS2-05-000	2-A04-SBS1-08-010	2-A04-SS1-02-000	2-A04-SBS1-03-005	Soil Remediation Criteria
Trench Locations	DTR-2	DTR-2	DTR-2	DTR-3	DTR-3	
Depth (feet)	0 to 0.5	0 to 0.5	9 to 10	0 to 0.5	4 to 5	
Metals (mg/kg)						
Arsenic (Method 6010)	2.7	2.9	2.7	3.7	5.8	100
Barium (Method 6010)	48	59	71	78	110	2,000
Cadmium (Method 6010)	ND (0.50 U)	ND (0.50 U)	ND (0.52 U)	1.2	1.3	20
Chromium (total) (Method 6010).	1.2	1.9	ND (1.0 U)	8.3	8.8	100
Lead (Method 7421)	12	ND (0.50 U)	3.6	* 150	* 110	100
Mercury (solid) (Method 7471)	ND (0.020 U)	ND (0.020 U)	ND (0.021 U)	ND (0.020 U)	0.062	4.0
Selenium (Method 7740)	ND (0.50 U)	ND (0.50 U)	ND (0.52 U)	0.60	ND (0.52 U)	20
Total Petroleum Hydrocarbons (Method 8015m) (mg/kg)						
TPH as diesel	ND (5.0 U)	ND (5.0 U)	ND (5.2 U)	ND (5.0 U)	ND (5.2 U)	100
TPH as gasoline	None detected.					
Semi-Volatile Organics (Method 8270) (mg/kg)						
Benzo(a)Pyrene	0.054 J	0.057 J	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	0.096
Benzo(b)Fluoranthene	0.052 J	0.086 J	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	0.96
Benzo(k)Fluoranthene	0.039 J	ND (0.33 U)	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	9.56
Bis(2-ethylhexyl)phthalate	ND (0.33 U)	0.045 J	ND (0.34 U)	0.078 J	0.052 J	50
Chrysene	0.051 J	0.060 J	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	95.9
Di-N-Butyl-Phthalate	ND (0.54 U)	ND (0.33 U)	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	8,000
Fluoranthene	0.037 J	0.046 J	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	3,200
Pyrene	0.039 J	0.047 J	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	2,400
TCL Pesticides/PCBs (Method 8080) (mg/kg)						
4,4-DDD	0.0014 J	ND (0.040 U)	ND (0.0021 U)	0.0073	0.010	2.91
4,4-DDE	0.042	0.036 J	0.0010 J	0.0084	0.014	2.06
4,4-DDT	0.012 J	0.016 J	0.0007 J	0.0030 J	0.035	2.06
PCB 1260	ND (0.10 U)	ND (0.40 U)	ND (0.021 U)	ND (0.020 U)	ND (0.042 U)	0.09
Volatile Organics (Method 8240) (mg/kg)						
Methylene chloride	NA	NA	ND (0.0052 U)	NA	ND (0.0052 U)	93.3
Nitroaromatics (Method 8330) (mg/kg)						
2,4,6-TNT	ND (0.010 U)	ND (0.001 U)	ND (1.0 U)	0.59 J	ND (1.0 U)	233.3
Herbicides (Method 8150) (mg/kg)	None detected.					

*** Superseded by Soil Remediation Criteria contained in Appendix A of this document.**

Key at end of table.

Table 3-17

SWMU A-04
BABBITT LANDFILL
RFI ANALYTICAL RESULTS
HAWTHORNE ARMY DEPOT
HAWTHORNE, NEVADA

Sample Number	2-A04-SBS1-04-010	2-A04-SS1-04-000	2-A04-SBS1-06-010	2-A04-SBS1-07-010	Soil Remediation Criteria
Trench Locations	DTR-3	DTR-4	DTR-4	DTR-5	
Depth (feet)	9 to 10	0 to 0.5	9 to 10	9 to 10	
Metals (mg/kg)					
Arsenic (Method 6010)	2.9	3.6	2.6	2.5	100
Barium (Method 6010)	73	77	58	67	2,000
Cadmium (Method 6010)	0.60	ND (0.50 U)	ND (0.52 U)	ND (0.52 U)	20
Chromium (total) (Method 6010)	3.8	2.0	1.4	1.0	100
Lead (Method 7421)	26	9.7	4.8	ND (0.52 U)	100
Mercury (solid) (Method 7471)	ND (0.020 U)	ND (0.020 U)	ND (0.021 U)	ND (0.021 U)	4.0
Selenium (Method 7740)	ND (0.51 U)	ND (0.50 U)	ND (0.52 U)	ND (0.52 U)	20
Total Petroleum Hydrocarbons (Method 8015m) (mg/kg)					
TPH as diesel	ND (5.1 U)	ND (5.0 U)	ND (5.2 U)	ND (5.2 U)	100
TPH as gasoline	None detected.				
Semi-Volatile Organics (Method 8270) (mg/kg)					
Benzo(a)Pyrene	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	ND (0.34 U)	0.096
Benzo(b)Fluoranthene	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	ND (0.34 U)	0.96
Benzo(k)Fluoranthene	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	ND (0.34 U)	9.56
Bis(2-ethylhexyl)phthalate	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	ND (0.34 U)	50
Chrysene	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	ND (0.34 U)	95.9
Di-N-Butyl-Phthalate	ND (0.34 U)	ND (0.55 U)	ND (0.34 U)	ND (0.34 U)	8,000
Fluoranthene	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	ND (0.34 U)	3,200
Pyrene	ND (0.34 U)	ND (0.33 U)	ND (0.34 U)	ND (0.34 U)	2,400
TCL Pesticides/PCBs (Method 8080) (mg/kg)					
4,4-DDD	ND (0.0020 U)	ND (0.0020 U)	ND (0.0021 U)	0.021	2.91
4,4-DDE	0.0021	0.0015 J	ND (0.0021 U)	0.0079 J	2.06
4,4-DDT	0.0012 J	ND (0.0050 U)	ND (0.0052 U)	0.075	2.06
PCB 1260	ND (0.020 U)	ND (0.020 U)	ND (0.021 U)	ND (0.010 U)	0.09
Volatile Organics (Method 8240) (mg/kg)					
Methylene chloride	0.0024 J	NA	ND (0.0052 U)	ND (0.0052 U)	93.3
Nitroaromatics (Method 8330) (mg/kg)					
2,4,6-TNT	ND (1.0 U)	ND (0.010 U)	ND (1.0 U)	ND (1.0 U)	233.3
Herbicides (Method 8150) (mg/kg)		None detected.			

Key at end of table.

Appendix D

A-04 Babbitt Landfill August 1999

A-04 Babbitt Landfill August 2000